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MEMORANDUM

TO: F.R. BRUCE

FROM: E.M. SHANK

SUBJECT: MTR-B PROJECT
WASTE SOLUTIONS

DATE: JUNE 8, 1951.

This document consists of
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Classification Cancelled or Changed

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To: F.R. Bruce

From: E.M. Shank

Subject: MTR-B Project
Waste Solutions

The production of Barium 140 from irradiated MTR assemblies leave liquid waste solutions requiring processing prior to discharge. Table 1 shows the waste resulting, per assembly processed, based on Flowsheet A and B as published with report FLS-715.

As may be seen from Table 1, all waste solutions except metal waste will be handled through normal "Hot Chemical Waste Disposal" facilities or will be discharged directly. These wastes are anticipated to be of small consequence to the Chemical Processing Plant operations and will therefore require no disposal development.

The metal waste solution will contain 98%+ of the uranium involved in the process. This solution will require storage for a minimum length of time, at present undetermined, and must be acceptable as a feed to the Idaho Chemical Processing Plant. The storage of metal waste must be made in "infinitely" safe tanks (i.e. 5" tanks on 30 inch centers with planes on 10 foot centers.) Two cells are available in the Idaho Plant for MTR-RaLa production. The maximum storage available per cell for metal solution is about 1850 L, providing a hold-up from processing seven assemblies before transfer to the main plant is required. Assuming storage is required from processing five assemblies one cell will be effectively eliminated for production facilities. The availability of duplicate facilities in the Idaho Plant, utilizing both available cells, is felt desirable to insure continuity of production and therefore the metal waste volume should be reduced to as low a value as is feasible. In addition, the injection of the present metal waste volume, containing a total of 540 mols of sulfate per assembly, may be dependent upon or influence the operation of the chemical plant. A decrease in dependence between MTR-RaLa production and the chemical plant operation will enable smoother overall operation of both.

Considering the above mentioned facts, recommendations and/or procedures covering the following are requested.

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- (a) Maximum sulfate ion concentration permissible in the "25" process.
- (b) Bleed-in procedure of MTR-RaLa metal waste with the chemical plant to insure adequate material control and minimum upset in the chemical plant's operation.
- (c) Metal waste volume reduction to enable storage of metal from the processing of ten assemblies without necessitating one complete cell for storage.

Possible means of accomplishing item (c) would be to remove sulfate ion from metal waste solution and volume reduce or to reduce initial volume of dissolver solution by partial separation of the aluminum solution from the metal sludge prior to acidification.

An early recommendation on the above is requested to facilitate design and pilot plant program.

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Unit #11524

TYPE OF WASTE	VOLUME PER ASSEMBLY	CONSTITUENTS	DISPOSITION
1. Metal		0.38M $Al_2(SO_4)_3$	To "25" Process
(a) Present	270.0L	0.57M Na_2SO_4	
(b) Maximum Desirable	185.0L	0.19M H_2SO_4	
(c) Preferred	12.0L	0.08M HNO_3	
		0.48 g/L Uranium	
2. Crude Product Wash	159.0L	0.25M H_2SO_4	To Hot Chemical Waste Disposal
3. Resin & Filter Aid Pretreatment	200.0L	0.74M HNO_3	To Cold Chemical Waste Disposal
		0.13M H_2SO_4	
		0.02M Na Versenate	
		0.09M HCl	
		0.07M H_2NO_3	
4. Filter & Column Preparation	90.0L	H_2O	To Hot Chemical Waste Disposal
5. Column Feed Effluent	17.0L	0.034M Na Versenate	To Hot Chemical Waste Disposal
6. Strontium Eluate	12.0L	0.036M Na Versenate	To Isotope Prod.
7. Product Purif.	78.0L	14.8M HNO_3	To Hot Chemical Waste Disposal
8. Equipment Clean-up	~600.0L	H_2O	To Hot Chemical Waste Disposal

MTR-E Project
Waste Solutions/Assembly Processed
Table 1